

REMARKS

Claims 1-17 have been cancelled as a result of the applicant's election of Group II (claims 18-24) without traverse. Claim 23 has been amended to overcome the examiner's objection by placing claim 23 in independent form. New claims 25-27 have been added. Reexamination and reconsideration are requested.

In the office action, dated January 18, 2007, the examiner rejected claims 18, 19, 21 and 24 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,536,324 issued to Fuchita ("Fuchita").

Claims 20 and 22 were rejected under 35 U.S.C. § 103(a) as being obvious over Fuchita.

The examiner indicated that the subject matter of claim 23 was allowable, but the examiner objected to claim 23 as being dependent upon a rejected base claim. Claim 23 has been amended to place it in independent form.

None of the pending claims are anticipated by or obvious over Fuchita, and the examiner's rejections are traversed, as is explained in more detail below.

Re the claims:

Claims 1-17 have been cancelled as a result of an election in response to a restriction requirement. The applicant reserves the right to file a divisional application at the appropriate time claiming the cancelled subject matter.

Claim 23 has been amended to place it in independent form. No new matter is introduced.

New claim 25 has been added. Support for the amendments can be found in the specification in at least the following locations: Figure 1; p. 8, lns. 1-2; p. 10, lns. 4-15; p. 23, lns. 16-21. No new matter is introduced.

New claims 26-27 have been added. Support for the amendments can be found in the specification in at least the following locations: Figure 1; p. 20, lns. 10-2; p. 24, lns. 2-9; p. 25, lns. 24-26. No new matter has been added.

Response to the Examiner's Rejections of Claims 18, 19, 21 and 24

A. Legal Standard For Demonstrating Anticipation Under 35 U.S.C. § 102

The standard for lack of novelty, that is, for anticipation under 35 U.S.C. § 102 is one of strict identity. “Every element of the claimed invention must be identically shown in a single reference.” *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990) (quoting *Diversitech Corp. v. Century Steps, Inc.*, 850 F.2d 675, 677 (Fed. Cir. 1988)). “These elements must be arranged as in the claim under review. . . .” *In re Bond*, 910 F.2d at 832. That is, “any degree of physical difference, however, slight, invalidates claims of anticipation.” *E.I. du Pont de Nemours & Co. v. Polaroid Graphics Imaging Inc.*, 706 F. Supp. 1135, 1142 (D. Del.), *aff’d without opinion*, 887 F.2d 1095 (Fed. Cir. 1989). As the Board has explained, “It is well established that an anticipation rejection cannot be predicated on an ambiguous reference. Rather, disclosures in a reference relied on to prove anticipation must be so clear and explicit that those skilled in the art will have no difficulty in ascertaining their meaning.” *Ex parte Allen*, 2004 WL 4980908, *2 (Bd. Pat. App. & Interf. 2004) (citing *In re Turlay*, 304 F.2d 893, 899 (C.C.P.A. 1962)).

B. Response to Rejections of Claims 18, 19, 21 and 24

The examiner rejected independent claim 18 and dependent claims 19, 21 and 24 as anticipated by Fuchita; however, the examiner failed to show strict identity between the disclosure of Fuchita and all the limitations of the claims. A prima facie case of anticipation has not been demonstrated.

Claim 18 requires “drawing a mixture of vaporized precursor material and process gas into an inlet end of a conduit, the process gas cooling the vaporized precursor material to precipitate said silver nano-particle material in a carrier stream.” Fuchita does not disclose this claim limitation for several reasons. First, Fuchita does not disclose “drawing . . . vaporized precursor material . . . into an inlet end of a conduit.” Rather, Fuchita discloses sucking ultra fine particles, not vaporized material, into the inlet port 31a of transfer pipe 31. Col. 6, lns. 26-29 (“The produced ultra fine particles flow upwards from the opening of the carbon crucible 22. They are sucked into the inlet port 31a of the transfer pipe 31 by the differential pressure of 2 atm.”) Second, Fuchita does not disclose precipitation of silver nano-particle material. Fuchita is directed to a gas deposition apparatus for producing a thick film by ejecting ultra fine particles from a nozzle onto a substrate. Fuchita does not disclose the size of the “produced ultra fine particles.” The examiner nonetheless argues that Fuchita “teaches a method of forming ultra fine particles (which are below 1 micron in diameter, see col. 6 line 61 for example . . .) However, col. 6, line 61 relates to the properties of *the film on the substrate*, not the ultra fine particles. Fuchita states: “The grain size *in the film* is below the diameter of 0.1 μm . . .” The grain size of the film is not the same as the grain size of the ultra fine particles. For these two reasons, strict identity has not been established and anticipation has not been proved.

Claims 19, 21 and 24 and new claims 25-27 ultimately depend from claim 18 and are allowable over Fuchita at least for the reasons that claim 18 is allowable. In addition, new claim 25 requires cooling of the vaporized precursor material to precipitate silver nano-particles in the conduit. Fuchita does not disclose this limitation; in Fuchita, all the ultra fine particles are produced *before* they enter inlet port 31a of transfer pipe 31. Claims 26 and 27 require collecting silver nano-particles. Again, as stated above, Fuchita does not disclose the size of the ultra fine particles. Even if such nano-particles were disclosed (which is denied), Fuchita does not teach a step of collecting nano-particles.

Response to the Examiner's Rejections of Claims 20 and 22

A. Legal Standard For Demonstrating Obviousness Under 35 U.S.C. § 103

The examiner has the burden of establishing a *prima facie* case of obviousness. *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998). If the examiner initially comes forward with sufficient evidence to support a ruling of obviousness, only then does the burden shift to the applicant to come forward with evidence or argument in rebuttal. *In re Kumar*, 418 F.3d 1361, 1366 (Fed. Cir. 2005). "When rebuttal evidence is provided, the *prima facie* cases dissolves, and the decision is made on the entirety of the evidence." *In re Kumar*, 418 F.3d at 1366.

The obviousness inquiry has two main components, both of which must be satisfied: (1) whether the prior art contained a suggestion or incentive to make the combination argued by the examiner, and (2) whether the prior art reveals that making the combination "would have a reasonable expectation of success." *In re Vaeck*, 947 F.2d 488, 493 (Fed. Cir. 1991). *See Gambro Lundia AB v. Baxter Healthcare Corp.*, 110 F.3d 1573, 1579 (Fed. Cir. 1997) ("The absence of such a suggestion to combine is dispositive in an obviousness determination.")

First, “[w]hen a rejection [under § 103] depends on a combination of prior art references, there must be some teaching, suggestion or motivation to combine the references.” *Ecolchem, Inc. v. So. California Edison Co.*, 227 F.3d 1361, 1372 (Fed. Cir. 2000) (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)). “Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. *Id.*, 227 F.3d at 1372 (quoting *ACS Hosp. Sys. Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577 (Fed. Cir. 1984)). The Federal Circuit has specifically forbidden “using the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention.” *In re Rouffet*, 149 F.3d at 1357. As the Federal Circuit has emphasized, “[i]f identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue.” *Id.* at 1357. Thus, the suggestion or incentive to combine references cannot be based on the “naked invocation of skill in the art to supply a suggestion to combine the references cited in this case” *Id.* at 1359. Indeed, as the Board has held, “conventionality does not suffice as a motivation to use the material.” *Ex parte Yamamura, et al.*, 2003 WL 23014636, *3 (Bd. Pat. App. & Interf. 2003). Instead, the examiner “must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.” *In re Rouffet*, 149 F.3d at 1357. That is a high standard indeed, since one of ordinary skill in the art “is also presumed to be one who thinks along the lines of conventional wisdom in the art and is not one who undertakes to innovate, whether by patient and often expensive, systematic research or by

extraordinary insights.” *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 454 (Fed. Cir. 1985).

While the requirement for showing a suggestion or incentive is generally “couched in terms of combining teaching found in the prior art, the same inquiry must be carried out in the context of a purported obvious ‘modification’ of the prior art. The mere fact that the prior art may be modified in the manner suggested by the examiner does not make the modification obvious unless the prior art suggested the desirability of the modification.” *In re Fritch*, 972 F.2d 1260, 1266 (Fed. Cir. 1992).

The second consideration is “whether the prior art would also have revealed that in so making or carrying out [the claimed composition or process], those of ordinary skill would have a reasonable expectation of success.” *In re Vaeck*, 947 F.2d at 493. “Obvious to try” is not the standard. *In re Dow Chem. Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988). “[S]elective hindsight is no more applicable to the design of experiments than it is to the combination of prior art teachings. There must be a reason or suggestion in the art for selecting the procedure used, other than the knowledge learned from the applicant’s disclosure.” *Id.*

In determining whether the prior art presents a suggestion to make the combination argued by the examiner, the entire field must be considered, including references that “teach away” from the claimed invention. *In re Dow Chem. Co.*, 837 F.2d at 473. References that teach away may not be used as the basis for an obviousness rejection. *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1354 (Fed. Cir. 2001) (“[R]eferences that teach away cannot serve to create a prima facie case of obviousness”); *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994) (citing cases). References “teach away” if they (1) discourage one of skill in the art from following the path laid out

in the reference; (2) lead one of skill in the art in a direction different from that taken by the applicant; or (3) suggest that the line of development flowing from the reference's teaching will not achieve the results sought by the inventor. *Tec Air, Inc. v. Denso Mfg. Mich. Inc.*, 192 F.3d 1353, 1360 (Fed. Cir. 1999). "Evidence that supports, rather than negates, patentability must be fairly considered." *In re Dow Chem. Co.*, 837 F.2d at 473.

In sum, for the examiner to meet his prima facie burden of showing obviousness, "[b]oth the suggestion and the reasonable expectation of success must be founded in the prior art, not in the applicant's disclosure." *In re Vaeck*, 947 F.2d at 493. And, the showing must be "clear and particular." *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999), *abrogated on other grounds*, *In re Gartside*, 203 F.3d 1305 (Fed. Cir. 2000).

In addition, only analogous prior art can be used as the basis of an obviousness rejection. *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004); *In re Clay*, 966 F.2d 656, 658 (Fed. Cir. 1992). Prior art is considered analogous if (1) it is within the same field of endeavor, regardless of the problem addressed; and (2) if the reference is not within the inventor's field of endeavor, if "the reference is still reasonably pertinent to the particular problem with which the inventor is involved." *In re Bigio*, 381 F.3d at 1325.

The Federal Circuit has held that "[t]his test for analogous art requires the PTO to determine the appropriate field of endeavor by reference to the explanations of the invention's subject matter in the patent application, including the embodiments, function, and structure of the claimed invention." *In re Bigio*, 381 F.3d at 1325. Further, the Federal Circuit has held that a "reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problems. Thus, the purposes of both the invention and the

prior art are important in determining whether the reference is reasonably pertinent to the problem the invention attempts to solve.” *In re Clay*, 966 F.2d at 659. The Federal Circuit concluded that, if the reference “is directed to a different purpose, the inventor accordingly would have had less motivation or occasion to consider it.” *Id.*

B. Response to Rejections of Claims 20 and 22

The examiner rejected claims 20 and 22 as obvious over Fuchita based on his rejection under §102 that all the limitations of the base claim, claim 18, were disclosed in Fuchita. However, the examiner failed to demonstrate obviousness by failing to show the presence or suggestion of all the claimed elements in the prior art. In addition, the examiner’s reliance on Fuchita was improper because the reference represents non-analogous, art and also teaches away from the claimed invention.

1. No prima facie showing of obviousness

As explained above, Fuchita does not disclose all the claim limitations of claim 18; therefore, the examiner has failed to demonstrate obviousness of claims 20 and 22 for that reason alone. The examiner did not demonstrate any independent basis for rejecting claim 18 as obvious. Nor did the examiner provide evidence of a suggestion or motivation to modify Fuchita to read on claims 18, 20 or 22. Nor did the examiner provide any evidence of a reasonable expectation of success from modifying the teachings of Fuchita for producing thick films through gas deposition to read on the claimed invention.

Claim 20 requires “heating the precursor material to a temperature in the range of about 1600 to about 2000°C.” Although the examiner acknowledged that Fuchita does not disclose the claimed range, he nonetheless rejected claim 20 as obvious over Fuchita, because “motivation to employ any heating range allowing for evaporation of the

precursor material, as required by Fuchita '324 . . . would have been obvious to one of ordinary skill in the art at the time the invention was made." However, such a conclusory statement of what would have been obvious is not evidence of obviousness. Where general conditions are disclosed in the prior art, the examiner does not meet his burden of demonstrating obviousness by merely stating that the claimed ranges would be obvious. *Ex parte Zank*, 1997 WL 1948992, *5 (Bd. Pat. App. & Interf. 1997) ("A "simple statement that it would have been obvious to optimize the method conditions and properties of the final product is insufficient to establish a prima facie case of obviousness.") Thus, the examiner must still demonstrate a suggestion or incentive to make the claimed combination or modification without resort to hindsight based on the applicant's specification. *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1321 (Fed. Cir. 2004). That did not happen here.

Claim 22 claims "contacting the vaporized precursor material with nitrogen." The examiner argues that "Fuchita allows for the use of any desired type of inert process gas." However, that is not what Fuchita teaches. The only "inert gases" that Fuchita discloses are the truly inert noble gases – helium, neon and argon. Fuchita does not mention nitrogen. Thus, there is no suggestion or motivation in Fuchita to select a relatively non-reactive gas, such as nitrogen, rather than a truly inert gas, like the noble gases. Given the teaching of Fuchita that is limited to disclosure of only noble gases, the only way the examiner would have known to modify the teachings of Fuchita to extend to nitrogen is by using the applicant's specification as a guide. That is hindsight reconstruction and it is not permitted. In addition, the examiner has provided no evidence of a reasonable expectation of success in using nitrogen, as opposed to the taught noble gases, to modify

the teachings of Fuchita to read on the claim 22. Again, the examiner has failed to make out a prima facie case that claim 22 is obvious over Fuchita.

2. Fuchita is non-analogous art

Fuchita is not analogous art and it is not reasonably pertinent to the present invention, either. Therefore, Fuchita is not available as a reference to demonstrate obviousness of the claimed invention.

The first step in determining whether art is analogous is to determine whether the cited reference and the present invention are in the same fields of endeavor. Plainly, they are not. Fuchita is directed to "a gas deposition apparatus, and more particularly to a gas deposition apparatus in which ultra fine particles are transported with an inert gas, and are ejected at a high speed from a nozzle onto a substrate positioned in direct facing relationship to the nozzle to form a thick film or condensate of the ultra fine particles on the substrate." Col. 1, lns. 6-13. In contrast, the present invention is directed to "production of nano-particles in general, and more particularly to a method and apparatus for producing nano-particles of silver (Ag)." Specification, p. 1, lns. 4-6. Thus, Fuchita is directed to gas deposition of a thick film on a substrate, while the present invention is directed to producing nano-particles. The fields of endeavor are different.

Even if the fields of endeavor were the same (which is denied), Fuchita is not a reasonably pertinent reference. The present invention and Fuchita's invention are directed to different purposes and seek to solve fundamentally different problems. Thus, an object of Fuchita's invention is "to provide a gas deposition apparatus in which a good film of UFP . . . can be securely and stably obtained for a long time." Col. 2, lns. 56-59. Fuchita seeks to solve the problem of developing a thick film on a substrate, without aggregates, "that can be stably formed for a long time." Col. 7, lns. 26-27. In contrast,

the present invention seeks to solve the problem of producing large quantities of nano-particles at low cost and within a narrow size range. Specification, p. 4, ln. 26 – p. 5, ln.

9. Since Fuchita “is directed to a different purpose [than the present invention], the inventor accordingly would have had less motivation or occasion to consider it.” *In re Clay*, 966 F.2d at 659. Therefore, since Fuchita is non-analogous art, it cannot form the basis for the examiner’s §103 obviousness rejections.

3. Fuchita teaches away

Fuchita also teaches away from the claimed invention and is therefore unavailable as a reference to support any obviousness rejections.

First, as mentioned above, the method taught by Fuchita differs significantly from the claimed method. The claimed method claims “drawing a mixture of vaporized precursor material and process gas into an inlet end of a conduit, the process gas cooling the vaporized precursor material to precipitate said silver nano-particle material in a carrier stream.” In contrast, as explained above, Fuchita teaches producing all the particles in ultra fine evaporation chamber 21 before they enter transfer pipe 31. Second, whereas the present invention, seeks to solve the problem of producing large quantities of nano-particle material within a narrow size range, Fuchita is not interested in the integrity or characteristics of his “ultra fine particles.” Rather, Fuchita is concerned with the characteristics of the thick *film* (deposited on a substrate) that results from his gas vapor deposition process. Since Fuchita is directed to the production of thick films on a substrate and not to the collection of particles, one seeking to solve the problem of producing large quantities of nano-particles within a narrow size range would not have turned to Fuchita at all.

New claims 25-27 are not obvious over Fuchita either. As stated above, new claim 25 requires cooling of the vaporized precursor material to precipitate silver nano-particles in the conduit. Fuchita does not disclose this limitation; in Fuchita, all the ultra fine particles are produced *before* they enter inlet port 31a of transfer pipe 31. There is no suggestion or incentive in Fuchita to change that process. Claims 26 and 27 require collecting silver nano-particles. Fuchita does not teach a step of collecting nano-particles. In fact, in teaching a process of depositing a thick film on a substrate, Fuchita teaches away from collecting any particles.

The applicant believes that all of the claims now pending in this patent application, as amended and described above, are allowable and that all other issues raised by the examiner have been addressed. Therefore, the applicant respectfully requests the examiner to reconsider his rejections and to grant an early allowance. If any questions or issues remain to be resolved the examiner is requested to contact the applicant's attorney at the telephone number listed below.

Respectfully submitted,



Susan E. Chetlin
Attorney for Applicants
PTO Registration No. 59,722
FENNEMORE CRAIG, P.C.
1700 Lincoln Street, Suite 2625
Denver, CO 80203
(303) 291-3200

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